REMARKS

Claim 10 is amended. Claims 2-3, 5-6, 8-10 and 31-32 are pending in the application.

Claims 2-3, 5-6, 8-10 and 31-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee, U.S. Patent No. 5,923,056; Vossen and Kern "Thin Film Processes II"; and Fujisada, JP 60-167352, or in the case of claim 9 in view of the combination of Lee, Vossen and Kern, and Fujisada in further view of Wolf "Silicon Processing for the VLSI Era, Vol. 1: Process Technology". The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Each of these factors must be shown in order to establish a *prima facie* case of obviousness, the burden of which is upon the Office. Claims 2-3, 5-6, 8-10 and 31-32 are allowable over the various cited combinations of Lee, Vossen and Kern, Fujisada and Wolf for at least the reason that the references, individually or as combined, fail to disclose or suggest each and every element in any of those claims, and fail to provide motivation for the recited subject matter.

As amended, independent claim 10 recites evaporating aluminum oxide and evaporating silicon monoxide from a source comprising silicon monoxide to form a vapor mixture, and depositing at least some of the mixture to form a silicon-doped porous aluminum oxide, an amount of silicon present in the silicon-doped aluminum oxide being controlled by controlling the evaporation rate during the evaporating silicon monoxide. The amendment to claim 10 is supported by the specification at, for example, page 9, lines 5-

10. Lee discloses formation of a silicon doped thin film by sputtering from an aluminum target containing 1% silicon in an argon/oxygen atmosphere (col. 5, ll. 59-63). Lee does not disclose or suggest the claim 10 recited evaporating aluminum oxide from a single crystal sapphire and evaporating silicon monoxide from a source comprising silicon monoxide to form a vapor mixture. Further, Lee does not disclose or suggest the recited controlling the evaporation rate of silicon monoxide to control the amount of silicon present in the resulting silicon-doped porous aluminum oxide.

Vossen and Kern discloses formation of films disclosed in Table 2 utilizing two-source evaporation. Within Table 2, Vossen and Kern disclose forming a high resistivity Cr-SiO film utilizing a Cr source and a SiO source (page 108). In an independent table (Table 3) Vossen and Kern discloses particular vapor species formed by evaporation of particular compounds including Al_2O_3 (at page 113) and SiO (at page 114). The Examiner indicates at pages 3-4 of the present Action that it would be obvious to use a silicon monoxide source and an aluminum oxide source to form a silicon-doped aluminum oxide because SiO and Al_2O_3 sources are well known and "will result in the same silicon-doped aluminum oxide as that disclosed in Lee" and because "use of separate sources to form a mixed or alloy layer is conventional, as taught by Vossen and Kern. First, applicant notes that the statement that use of "a silicon monoxide source and an aluminum oxide source . . . will result in the same silicon-doped aluminum oxide as that disclosed in Lee" is conclusory. Nothing in any of the cited references suggests this result and no reasonable basis for such statement is given in the Action. Additionally, the two-source evaporation of Cr and SiO to form Cr-SiO films and the general disclosure of two-source sputtering does not suggest a specifically recited evaporating from single crystal sapphire and evaporating

from a source comprising silicon monoxide. Further, as combined with Lee, Vossen and Kern does not contribute toward suggesting the claim 10 recited controlling an amount of silicon present in the silicon-doped aluminum oxide by controlling the evaporation rate of silicon monoxide. Accordingly, independent claim 10 is not rendered obvious by the cited combination of Lee and Vossen and Kern.

The Examiner indicates at page 4 of the Action that the present rejection could be overcome by providing evidence that specific use of silicon monoxide and aluminum oxide provides unexpected results in the film relative to the source used in Lee. Applicant notes that the present claims are method claims and therefore evidence that the recited elements provide unexpected advantages to the method is sufficient to overcome an obviousness rejection. As set forth in the applicant's specification at, for example, page 8, line 21 through page 9, line 13; page 11, line 18 through page 12, line 4; and page 12, line 14 through page 13, line 2, the use of a silicon monoxide source allows thermal evaporation at much lower temperature than other silicon comprising sources and can be deposited on cooler substrates with good adherence. As further explained, the silicon monoxide source is relatively cheap, simple and evaporation therefrom is easier to control which allows the relative concentration of silicon within the aluminum oxide to be adjusted by controlling the evaporation rate of silicon monoxide relative to that of aluminum oxide. Accordingly, the recited evaporating aluminum oxide from single crystal sapphire and evaporating silicon monoxide from a source comprising silicon monoxide confers distinct advantages to the claimed method. Further, none of these advantages are suggested by the combination of Vossen and Kern and Lee, and therefore motivation for the combination is lacking. Accordingly, independent claim 10 is non-obvious over the cited combination of Lee and

Vossen and Kern and is allowable over these references.

As indicated at page 4 of the present Action, Fujisada is relied upon as showing deposition of aluminum oxide utilizing a sapphire target. As further indicated at page 7 of the present Action, Wolf is relied upon as showing a monocrystalline or "single crystal" silicon substrate. As combined with Vossen and Kern and Lee, neither Wolf nor Fujisada contributes toward suggesting the claim 10 recited depositing a silicon-doped porous aluminum oxide by evaporating aluminum oxide from a single crystal sapphire and evaporating silicon monoxide from a silicon monoxide source, and controlling the amount of silicon present in the silicon-doped aluminum oxide by controlling the evaporation rate during evaporation of silicon monoxide. Accordingly, independent claim 10 is not rendered obvious by the various cited combinations of Lee, Vossen and Kern, Fujisada and Wolf and is allowable over these references.

Dependent claims 2-3, 5-6, 8-9 and 31-32 are allowable over the various cited combinations of Lee, Vossen and Kern, Fujisada and Wolf for at least the reason that they depend from allowable base claim 10.

For the reasons discussed above, claims 2-3, 5-6, 8-10 and 31-32 are allowable. Accordingly, applicant respectfully requests formal allowance of claims 2-3, 5-6, 8-10 and 31-32 in the Examiner's next action.

Respectfully submitted,

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